OSR 91-688 (Rev 11-20-97)
Stores: 26-8910.00

WESTINGHOUSE SAVANNAH RIVER COMPANY
INTEROFFICE MEMORANDUM

HLW-WRE-2001-00008
Track No.: 10080
Disp. Auth.: DOE 14-6a
Retention: Until Tank 18F is removed from service

February 27, 2001

To: N. R. Davis, 703-H

From: M. S. Miller, 742-3G

PATH FORWARD HLW-PF-2001-002; TANK 18 TOPOGRAPHICAL MAP AND SAMPLING REQUIREMENTS

References:

1. DPSOX-9934, "Tank 18F Waste Removal," February 19, 1986.

BACKGROUND:

From July 1959 to August 1987, Tank 18F received PUREX and non-canyon waste. The sludge solids deposited from F-Canyon were a product of Low Heat Waste (LHW) streams. Tank 18F non-canyon receipts consisted of various forms of supernate, LHW and High Heat Waste, evaporator overheads, dissolved salts and sludge slurries received from Tanks 2F, 7F, 13H, 17F, 19F, 20F, 30H, 33F and 34F. Sludge removal operations in Tank 18F began in April 1986 and approximately 94% of the 551,000 gallons of sludge were removed from Tank 18F using three (3) standard slurry pumps. The last sludge transfer from Tank 18F occurred in August 1987 with the material being transferred to Tank 51H.

Based on photos taken on May 25, 1988, the estimated sludge volume in Tank 18F is approximately 37,000 gallons. In 1996, Tank 18F received transfers from Tanks 17F and 20F in preparation of closure of both of those tanks. Tank 17F started with 10,000 gallons of sludge and transferred 7,800 gallons to Tank 18F. Tank 20F started with 1,000 gallons of sludge and transferred only supernate. After the Tank 17F and 20F transfers, the sludge volume in Tank 18F was approximately 44,000 gallons.

On October 2, 2000, a transfer of the contents of Tank 19F to Tank 18F was started. The composition of the Tank 19F inventory is estimated as 13,000 gallons of spent zeolite, 7,000 gallons of metal oxides/hydroxides (standard sludge) and 13,000 gallons of insoluble salts. The goal is to transfer the 33,000 gallons from Tank 19F to Tank 18F, as of this date approximately 20,300 gallons of sludge has been transferred to Tank 18F.

DISCUSSION

After the Tank 18F sludge removal operations, the sludge height in the West riser was approximately 4", this height is based on reviewing tank photos and experience gained from the Tank 8F transfer activities. Prior to the start of the transfer from Tank 19F to Tank 18F, the West riser was sludge sounded and the height was found to be 26" based on a conversation with the Operation's Day Shift Manager. The increase in height is due to the addition of approximately 7,800 gallons of Tank 17F sludge to Tank 18F's West riser. Tank 18F's West riser is

also the transfer path used for the Tank 19F to Tank 18F transfer. Any material added to Tank 18F through the West riser is dispersed over a 10' by 10' area approximately. Utilizing a 10' by 10' area of dispersion and the amount of material added to date (20,300 gallons) from the Tank 19F transfer, the estimated height under the West riser is 72". The attached topographical map was generated using tank photos and the estimated height addition as a result of the Tank 19F transfer. The topographical map was generated assuming a total of 32,000 gallons of sludge is transferred from Tank 19F to Tank 18F, which would result in a 98" mound of material located under the West riser.

By totaling the sludge amounts added to Tank 18F, including the completion of the Tank 19F transfer, and the amount of material left in Tank 18F after the transfers to Tanks 40H, 42H and 51H, the sludge volume in Tank 18F will be approximate 76,000 gallons. Based on the topographical map and assuming that the center mound of sludge is all 20" high, the following estimations were made for sludge volume:

General Equation

Sludge volume per area = Height of material X 3540 gallons of material/inch of material X Ratio of Tank Area Involved.

West riser – 98" X 3540 X 1/8 of Tank Area=43365 gallons
Center & South risers – 20" X 3540 X ½ of Tank Area=35400 gallons
East riser – 10" X 3540 X 3/16 of Tank Area=6638 gallons
Northwest riser – 4" X 3540 X 3/16 of Tank Area=2655 gallons

Total sludge volume is approximately 88,000 gallons.

In an attempt to determine the need for sampling, the waste received in and sent out of Tank 18F was determined by reviewing the information in the Waste Transfers & Additions & Canyon Waste Receipts databases. Approximately 94% of the initial 551,000 gallons of sludge were removed from Tank 18F and sent to Tanks 40H, 42H and 51H. The original sludge level in Tank 18F was approximately 155" prior to transfer activities. After reviewing tank photos, the highest remaining sludge mounds in Tank 18F, after the transfers, was approximately 20". A sludge sample has been taken for Tank 19F to support closure activities, but has not been analyzed as of this date. Based on the results of the Tank 19F sample, discussions with Operations about the ability to mobilize sludge in Tank 18F and photographic evidence, it is believed that no new sludge sampling is required for Tank 18F. However, it is recommended that an in-situ height and sludge penetration/density measurement be performed in the Center riser. The probing of the Center riser is required to support the assumption that the Modified Advanced Design Mixer Pump (Modified ADMP) or Advanced Design Mixer Pump (ADMP) will be inserted in the tank in only one step. The current schedule has a very aggressive operations phase, which will not permit a phased insertion of the Modified ADMP or ADMP. The Center riser probing will identify any potential problems that could impact the schedule and give Engineering time to resolve these problems.

During the Tank 18F transfer operations a BIBO pump will be installed in the Northeast riser where the Telescoping Transfer Pump (TTP) currently resides. During installation of the TTP, the TTP was inserted to the bottom of Tank 18F and then shimmed to its current position of 1" above tank bottom. Since the TTP will be removed from the tank and the BIBO pump will be installed in its place, no riser probing/sludge density measurements are required.

PATHFORWARD

1. Initiate in-situ height and sludge penetration/density measurements in Tank 18F's Center riser in preparation for installation of the Modified ADMP or ADMP. [Resp. WROps]

In summary, no new sludge samples are required for Tank 18F, prior to the initiation of transfer activities. The Northeast riser will not require riser probing/sludge density measurements prior to installation of the BIBO pump. However, it is recommended that an in-situ height and sludge penetration/density measurement be performed in the Center riser to identify any potential problems that could impact the scheduled insertion of the Modified ADMP or ADMP.

CONCURRENCE:

2/27/01

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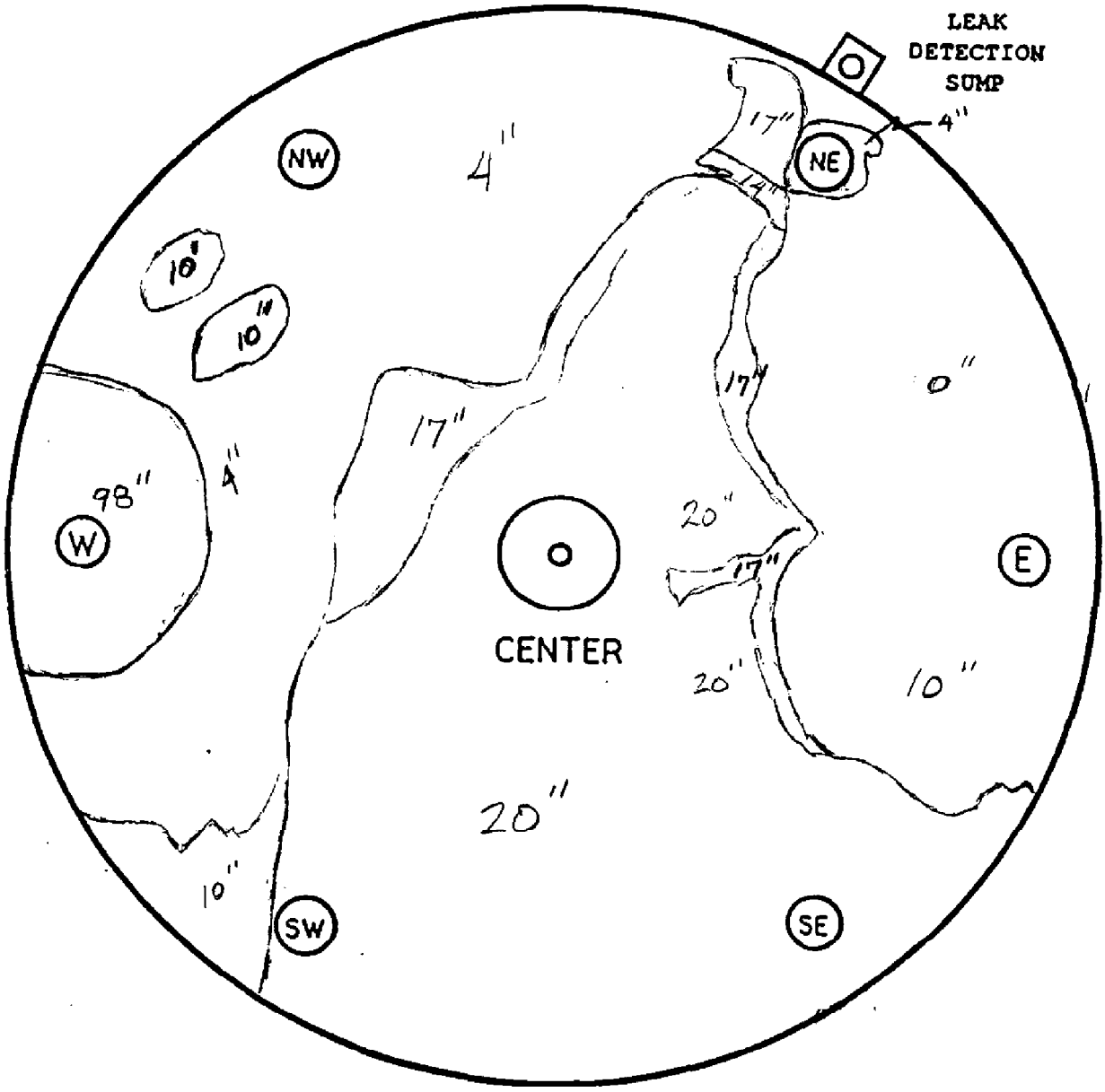
Attachment

TANK 18


LEAK
DETECTION
SUMP
4"
17"
NW
NE
4"
10"
10"
17"
0"
17"
98"
W
4"
20"
17"
E
CENTER
20"
10"
20"
10"
SW
SE